



Energy and Environment Cabinet

Center for Renewable Energy Research and
Environmental Sustainability

August 16, 2011

Greg Guess
Kentucky Department for Energy
Development and Independence

Governor Beshear's Energy Strategy

"Intelligent Energy Choices for Kentucky's Future"

Strategy 1: Improve the Energy Efficiency of Kentucky's Homes, Buildings, Industries, and Transportation Fleet

Strategy 2: Increase Kentucky's Use of Renewable Energy

Strategy 3: Sustainably Grow Kentucky's Production of Biofuels

Strategy 4: Develop a Coal-to-Liquids Industry in Kentucky to Replace Petroleum-Based Liquids

Strategy 5: Implement a Major and Comprehensive Effort to Increase Gas Supplies, Including Coal-to-Gas in Kentucky

Strategy 6: Initiate Aggressive Carbon Capture/Storage (CCS) Projects for Coal-Generated Electricity in Kentucky

Strategy 7: Examine the Use of Nuclear Power for Electricity Generation in Kentucky

Energy Efficiency Initiatives

EECBG Small Cities and Counties Initiative – DLG		Kentucky Energy Efficient Appliance Rebate Program
Energy Management Software and Controls for State Buildings – FAC		Kentucky Farm Energy Efficiency and Renewable Energy Partnership – GOAP
Green Bank of Kentucky – FAC		Kentucky Green and Healthy Schools Program (GHS) – KEEC
High Performance State Government Building Staffing - FAC		Kentucky Home Performance with ENERGY STAR - KHC
High Performance Sustainable Energy Research Laboratory – UK		Kentucky Multi-County Collaborative Agricultural Energy Initiatives Program – GOAP
Housing, Buildings, and Construction Energy Efficiency Codes Inspection and Training – KDHBC		Kentucky National Energy Education Development (NEED) Project
Stimulating Energy Efficiency in Kentucky - US DOE Cooperative Agreement		Kentucky Net-Zero Energy Schools – Kenton County
Industrial Facility Retrofit Showcase – CED		Kentucky Net-Zero Energy Schools – Warren County
Industrial/Commercial Sustainability Program		Save Energy Now – KPPC
KDHBC - Building Energy Codes Training - Portland		State Energy Assurance Planning
Kentucky Energy Efficiency Program for Schools - Energy Managers (SEMP)		University Energy Education Curriculum Project
Kentucky Energy Efficiency Program for Schools (KEEPS) - KPPC		Utility Smart Grid Initiative

\$68 million Investment

Kentucky Energy in Education Collaborative

- Kentucky Energy Efficiency Program for Schools (KEEPS) - KPPC/UofL
- School Energy Managers Program (SEMP)- KSBA
- Kentucky NEED Project
- Kentucky Green and Healthy Schools - KEEC/KDE
- Kentucky School Plant Managers Association
- Hybrid Horsepower for Kentucky Schools – KCFC/ KDE



IMPACT -

\$3.2 Million Annual Energy Savings

\$645K Energy Rebates and Refunds

173 School Districts Enrolled in KEEPS

50 School Energy Managers Serving 144 School Districts

955 Teachers Trained by NEED Workshops

39 Hybrid School Buses Deployed (213 total deployment)



Kentucky ENERGY STAR Schools



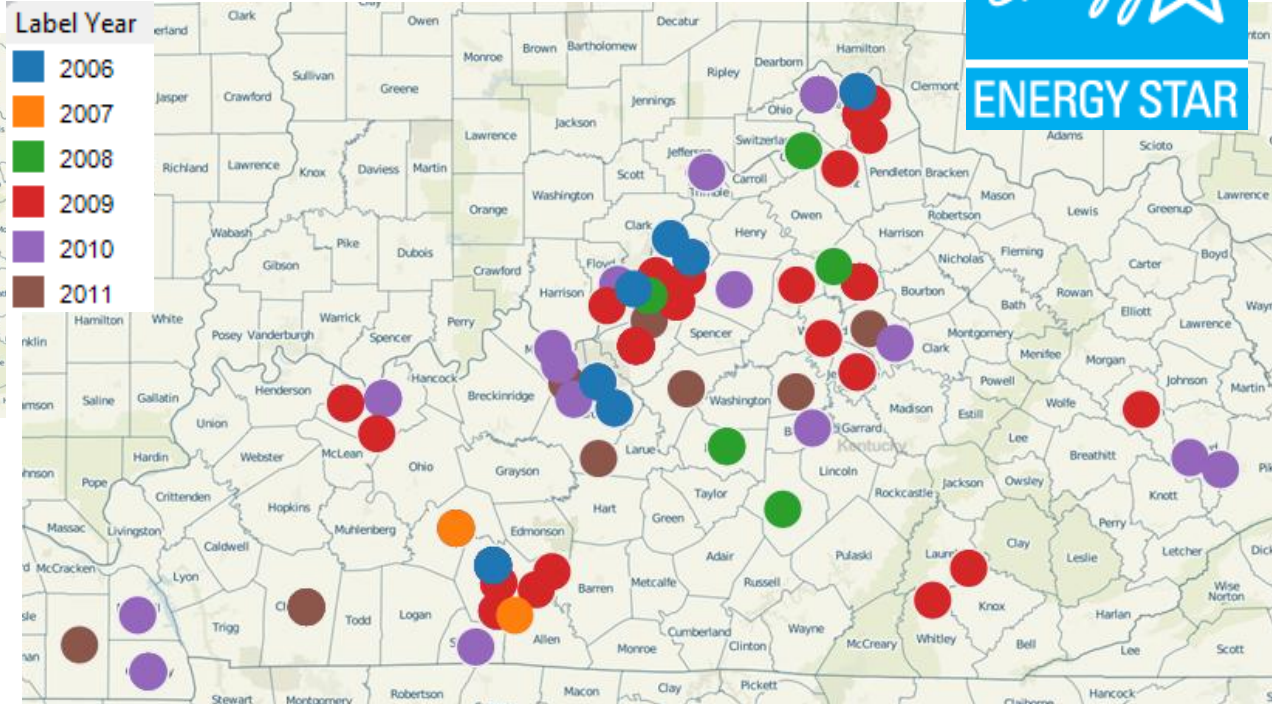
2008



**17 ENERGY STAR
Labeled Schools**



June 2011



105 ENERGY STAR Labeled Schools

The ENERGY STAR labeled schools use 20-30 less energy than traditionally built schools.

Kentucky Net Zero Energy Schools



**Turkey Foot Middle School
Kenton County**

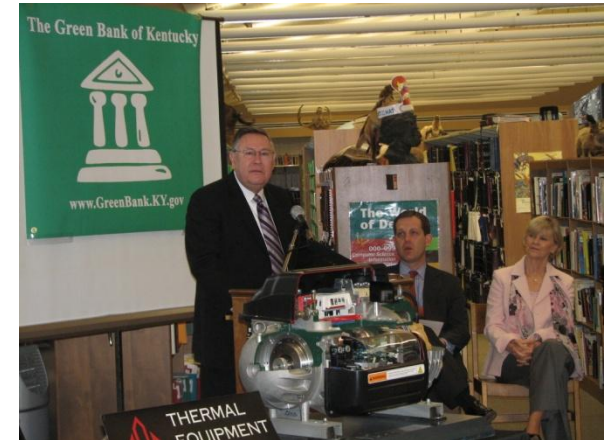


**Richardsville Elementary School
Warren County**



Green Bank of Kentucky

Manager	KY Finance and Admin Cabinet
Eligible Renewable/Other Technologies:	Solar Water Heat, Photovoltaics, Wind, Biomass, Geothermal Heat Pumps, Anaerobic Digestion
Applicable Sectors:	State Government Facilities
Amount:	Minimum loan: \$50,000
Maximum Incentive:	Not specified
Terms:	Payback: 15 years
Program Budget:	\$14,170,579



Contract Awards

Green Bank of Kentucky	Award	Project Start	Life of Loan
Department of Education	1,295,267.00	12/10/2009	12 years
Old Capitol Campus	171,474.88	8/27/2010	10 years
701 Holmes Street Office Complex	114,211.00	8/27/2010	10 years
Kentucky Education Television - KET	1,818,725.23	9/8/2010	14 years
KY Department of Veterans' Affairs	2,248,599.00	12/22/2010	14 years
Facilities and Administration Cabinet	2,603,682.00	12/28/2010	14 years

Total Loan Amount **8,251,959.11**

Kentucky Appliance Rebate Program



Total Rebate - \$3.84 million

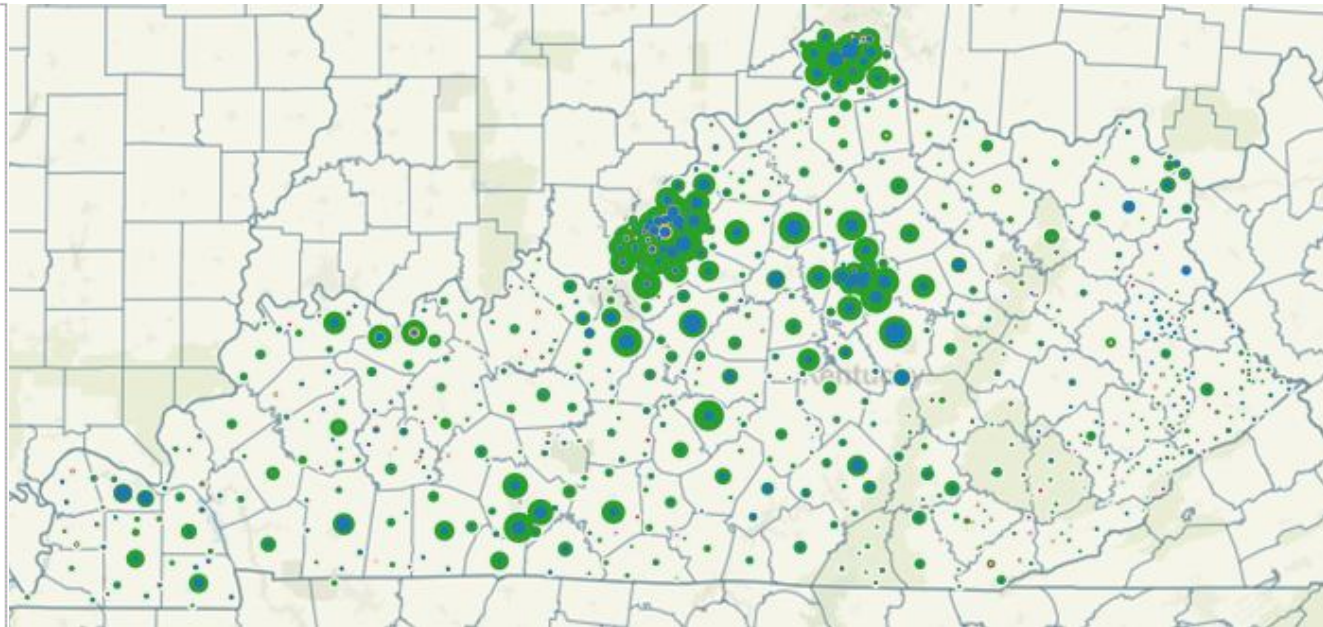
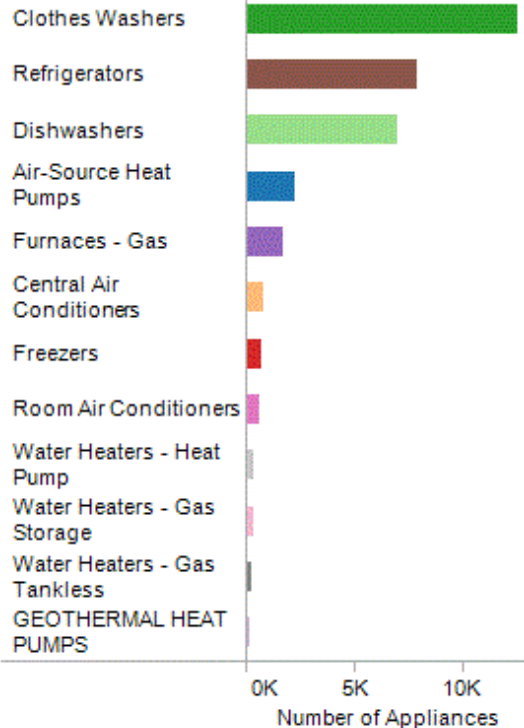
Participating Kentuckians – 34,716

Sales Revenue - \$51 million

State Sales Tax Collected - \$3 million

Annual Energy Savings - 47,138 mmbtu (Energy to run 965 households per year)

Product Category



Stimulating Energy Efficiency in Kentucky (SEE-KY)

- \$500,000 Cooperative Agreement with US Department of Energy (3-year program)
- Partners include Midwest Energy Efficiency Alliance, American Council for an Energy-Efficiency Council, Oak Ridge National Laboratory and Smith Management Group.
- Combines rigorous data analysis and inclusive stakeholder process to find what works best in Kentucky to deliver cost-effective energy efficiency.
- Project Goal - Integrate energy efficiency into Kentucky's economy so that an eventual 1% annual savings goal can be achieved.

Kentucky Save Energy Now Program

- Sponsored by KPPC/ U of L Speed School of Engineering
- Helps energy-intensive facilities build self-sustaining energy-savings programs
- Goal to reduce energy use in these facilities by 2.5 percent per year for 10 years
- Offers assessments, training, demonstrations, assistance and recognition
- Partners include LGE/KU, East Kentucky Power Cooperative, the Tennessee Valley Authority, Duke Energy, Big Rivers Electric, Fellon-McCord and Associates



KENTUCKY
SAVE ENERGY
NOW



UK CAER Renewable Energy Laboratory

Ky-Argonne Battery Center

- Renewable energy industries
- Electrochemical power sources (capacitors and batteries)
- Biomass and biofuels
- Distributed solar energy technologies

\$19.8 M Investment

\$11.8M USDOC NIST

\$3.5M EEC/DEDI

\$3.5M CED

\$1.0M UofK



UK's first LEED-certified laboratory
June 2011



Kentucky Energy Profile 2010



2010 Annual Summary

Kentucky State Energy Program – ARRA (Recovery) – \$52,533,000

- ▶ **Kentucky Energy Efficiency Program for Schools (KPPC) – \$4,758,588**

Funding will support the expansion of the Kentucky Energy Efficiency Program for Schools (KEEPS). The KEEPS program helps Kentucky school districts reduce energy consumption and operating expenses. The program is administered by the Kentucky Pollution Prevention Center (KPPC), University of Louisville. (Funding: 100% Obligated)

- ▶ **Kentucky School Energy Managers Program (KSBA) – \$5,050,012**

Funding will support providing energy managers at the school district level that will help promote and achieve the goals and objectives of the Kentucky Energy Efficiency Program for Schools. The School Energy Managers Program (SEMP) will be administered through a partnership with the Kentucky School Boards Association (KSBA). (Funding: 100% Obligated)

- ▶ **Kentucky Green and Healthy Schools Program (KEEC) – \$214,800**

Funding will support the expansion of the Kentucky Green and Healthy Schools (GHS) Program sponsored by the Kentucky Environmental Education Council (KEEC), Kentucky Education and Workforce Development Cabinet. This program is designed to improve the knowledge base about energy and related environmental topics for students, teachers and administrators in all Kentucky schools. (Funding: 100% Obligated)

Kentucky State Energy Program – ARRA (Recovery) – \$52,533,000

▶ **Kentucky National Energy Education Development (NEED) Project – \$1,122, 500**

Funding will support the expansion of the Kentucky National Energy Education Development (NEED) program. NEED focuses on the scientific concepts of energy and provides objective, grade-appropriate information about conventional and emerging energy sources— their use and impact on the environment, economy, and society. NEED will hire regional coordinators, purchase additional classroom energy kits and secure NEED training materials to support Kentucky's school districts. (Funding: 100% Obligated)

▶ **Green Bank of Kentucky, an Energy Efficiency Revolving Loan Fund (FAC) – \$14,170,579**

Funding will support the establishment of a state agency “Green Bank” revolving loan fund that will finance energy efficiency upgrades in government buildings. The “Green Bank” will be administered by the Kentucky Finance and Administration Cabinet (FAC) and will allow public agencies to compete for low- or no- interest loans for worthy energy efficiency projects. (Funding: 100% Obligated)

▶ **Energy Management Software and Controls for State Buildings (FAC) – \$3,650,000**

The purchase of energy management software and controls will permit state agencies to take a critically important basic step in its efforts to reduce energy use by giving the State much wider capability to monitor and manage the operation of the energy consuming systems in its buildings. (Funding: 100% Obligated)

Kentucky State Energy Program – ARRA (Recovery) – \$52,533,000

▶ **High Performance State Government Building Staffing (FAC) – \$1,100,000**

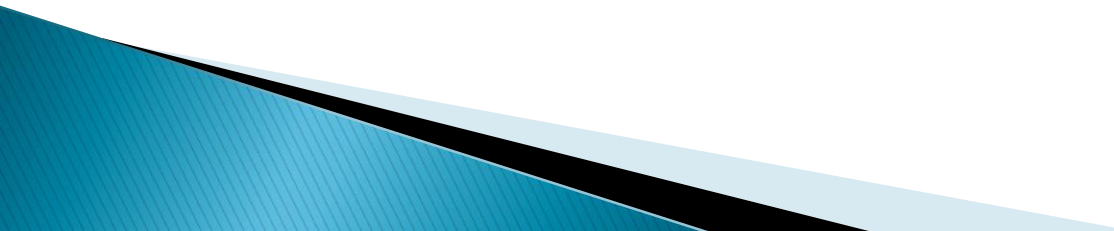
Funding will support staff or contractor positions in FAC to provide enhanced performance contract management and technical services and will allow the Commonwealth of Kentucky to greatly expand its efforts to reduce energy consumption by its facilities. (Funding: 100% Obligated)

▶ **Kentucky Farm Energy Efficiency and Renewable Energy Partnership (GOAP) – \$1,706,796**

Funding will support the Governor's Office of Agricultural Policy to implement an "On-Farm Energy Efficiency and Production Program" that will increase energy efficiency and opportunities for renewable energy improvements at Kentucky's farms and farming communities. Funding will supplement tobacco settlement funds to provide grants to farmers for energy assessments and on-farm energy efficiency and renewable energy improvements. (Funding: 100% Obligated)

▶ **Kentucky Multi-Farm Collaborative Agricultural Energy Initiatives Program (GOAP) – \$293,204**

Funding will support the Governor's Office of Agricultural Policy to supplement tobacco settlement funds for grants to multi-county collaboratives to enhance and advance renewable energy production at the farm level. Funding will be made available for demonstration projects in the areas of energy efficiency and renewable energy production. (Funding: 100% Obligated)



Kentucky State Energy Program – ARRA (Recovery) – \$52,533,000

▶ **Kentucky Home Performance with ENERGY STAR (KHC) – \$4,000,000**

The objective of this initiative is to produce an economically sustainable model for stimulating the residential home improvement market to accept and increasingly make whole-house energy efficiency and renewable energy improvements. Working with the Kentucky Housing Corporation (KHC) an implementation plan will serve to launch a statewide approach to Home Performance with ENERGY STAR (HPwES) with coordinated marketing, training, and quality assurance. (Funding: 100% Obligated)

▶ **Industrial/Commercial Sustainability Program (KPPC) – \$2,230,000**

This program, modeled after the U.S. Department of Energy's Industrial Assessment Centers (IAC), will increase funding for KPPC, University of Louisville, to perform energy analyses at industrial, commercial and institutional firms or organizations. The program will also conduct energy efficiency workshops for target groups. (Funding: 100% Obligated)

▶ **Utility Smart Grid Initiative – \$1,753,070**

This project supports the integration of "smart grid" strategies and technologies into Kentucky's electric utility infrastructure with funding provided for Kentucky to establish a program in partnership with electric utilities to explore development of smart grid concepts and their possible application in Kentucky with the potential to result in significant energy and cost savings for Kentucky ratepayers. (Funding: 0% Obligated, RFP completed with funds to be obligated upon award)



Kentucky State Energy Program – ARRA (Recovery) – \$52,533,000

▶ **Industrial Facility Retrofit Showcase (CED) – \$4,400,000**

Funding will be provided to the Kentucky Cabinet for Economic Development (CED) for the purposes of energy efficiency and renewable energy grants to industries locating or expanding operations in Kentucky that create or retain "green jobs" while saving energy and reducing carbon emissions. (Funding: 100% Obligated)

▶ **High Performance Sustainable Energy Research Laboratory (UK) – \$3,500,000**

Funding will be used to finance energy efficiency and renewable energy measures for the High Performance Sustainable Research Laboratory building that will take the building from a "meets code" building to a better-than-code building. This will support a new state-of-the-art Advanced Battery Strategic Planning (ABSP) facility utilizing \$11.8 million in funds received from the National Institute for Standards and Technology (NIST) awarded to the University of Kentucky. Funds may be used for building envelope improvements, energy efficient lighting, efficient HVAC, motors, pumps, or other energy consuming systems on the site. Funds may also be used to incorporate various renewable energy technologies in the facility as well as for energy modeling and other reasonable design costs associated with energy efficiency or renewable energy features of the facility. Funds will not be used for energy research or the purchase of research equipment. (Funding: 0% Obligated, MOA drafted with the University of Kentucky Research Foundation)

▶ **Kentucky Net-Zero Energy Schools – \$2,000,000**

Funding will provide partial match for one or more schools to fund solar photovoltaic systems sufficient to bring the school to net-zero or near-net-zero energy use. (Funding: 0% Obligated, RFP completed with funds to be obligated upon award)

Kentucky State Energy Program – ARRA (Recovery) – \$52,533,000

▶ **KDHBC - Building Energy Codes Training – Portland - \$8,146**

Funding will provide the Kentucky Department for Housing, Buildings and Construction (KDHBC) to offer education to six employees by attending the Energy Codes 2009 Workshop in Portland, Oregon. The information gathered will be used to educate not only HVAC inspectors but also local jurisdictions and contractors who will be installing the systems. (Funding: 100% Obligated)

▶ **DEDI Program Management – \$2,487,866**

DEDI will utilize funds to add administrative staff to address issues related to oversight of over \$52 million dollars of SEP Recovery Act funding. This includes developing detailed program budgets, identifying scopes of work, establishing milestones, drafting contracts, approving invoices, reviewing and consolidating reports, auditing expenditures, tracking metrics and monitoring and evaluating program performance, among other things. (Funding: 100% Obligated)

Energy Efficiency and Conservation Block Grant (EECBG) – \$10,427,000

- ▶ **Kentucky Department for Local Government (DLG) – \$6,612,880**

At least 60% of EECBG funds received will be made available to units of local government that were not eligible to receive direct funding from the Department of Energy. EEC will enter into an agreement with DLG to help coordinate the development of a competitive grant application process and distribution of EECBG funds to units of local government in the state that were not eligible for direct grants from DOE. (Funding: 100% Obligated)

- ▶ **Kentucky Net-Zero Energy Schools – \$1,376,562**

Funding will provide partial match for one or more schools to fund solar photovoltaic systems sufficient to bring the school to net-zero or near-net-zero energy use. (Funding: 0% Obligated, RFP completed with funds to be obligated upon award)

- ▶ **Housing, Buildings, and Construction Energy Efficiency Codes Training (KDHBC) - \$457,153**

Funding will support the Kentucky Department for Housing, Buildings and Construction (KDHBC) to provide training programs focusing on the 2009 Building Code that stresses energy efficiency and conservation in the construction of buildings. Training will be provided to residential and commercial construction professionals throughout the Commonwealth of Kentucky to ensure all newly constructed or substantially rehabilitated buildings are energy efficient in their design and construction. (Funding: 100% Obligated)

Energy Efficiency and Conservation Block Grant (EECBG) – \$10,427,000

- ▶ **Housing, Buildings, and Construction Energy Efficiency Codes Inspection (KDHBC) - \$1,198,895**

Funding will support the Kentucky Department for Housing, Buildings and Construction (KDHBC) to fund the initial start-up costs associated with the creation and implementation of a new program to promote energy efficiency in new construction, both commercial and residential, throughout the Commonwealth. The program is planned to be self-sustaining after the first year of inspections and will be administered by KDHBC. A goal is to begin work on updating building codes and providing for 90% compliance with those codes within eight years. (Funding: 100% Obligated)

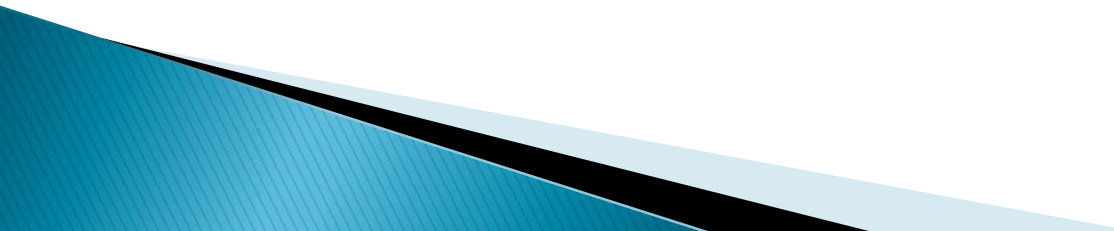
- ▶ **DEDI Program Management – \$735,484**

Funds will support additional staff and provide resources to address issues related to oversight of the Energy Efficiency and Conservation Block Grant (EECBG) program. This includes developing detailed program budgets, identifying scopes of work, establishing milestones, drafting contracts, approving invoices, reviewing and consolidating reports, tracking metrics, and monitoring and evaluating program performance, among other things. (Funding: 100% Obligated)

Kentucky Program for Industrial Energy Efficiency - Save Energy Now (Recovery) – \$349,976

- ▶ This grant will support KPPC, University of Louisville, to help businesses, industries and other organizations develop environmentally sustainable, cost-saving solutions for improved efficiency. The program will assist industrial facilities in Kentucky to obtain, achieve, and sustain an annual reduction in energy intensity of 2.5% per year for an initial period of three years. (Funding: 100% Obligated)

Kentucky Energy Efficient Appliance Rebate Program - SEEARP (Recovery) – \$4,096,000

- ▶ This grant will support KPPC, University of Louisville, to help businesses, industries and other organizations develop environmentally sustainable, cost-saving solutions for improved efficiency. The program will assist industrial facilities in Kentucky to obtain, achieve, and sustain an annual reduction in energy intensity of 2.5% per year for an initial period of three years. (Funding: 100% Obligated)
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Enhancing State Government Energy Assurance Capabilities and Planning for Smart Grid Resiliency (Recovery) – \$591,715

- ▶ *The purpose of the grant is to strengthen and enhance state and local government energy assurance planning and energy system resiliency by building upon existing energy assurance plans and by incorporating Smart Grid applications that will allow Kentucky to better prepare and respond to energy disruptions. (Funding: 100% Obligated)*



Energy and Environment Cabinet

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